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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,566	06/28/2001	Masato Imai	09793822-0149	5465

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EXAMINER	
NGUYEN, HOAN C	
ART UNIT	**PAPER NUMBER**
2871	

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/894,566	IMAI ET AL.	
	Examiner	Art Unit	
	HOAN C. NGUYEN	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 December 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-12 and 14-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 4-12 and 14-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Applicants amend claim 1, submit new claims 14-20 and canceled claims 2-3 and 13. Therefore, claims 1, 4-12 and 14-20 are pending now.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1, 6, 11-12, 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over an applicant's admitted prior art (AAPA) in view of Tokuo (JP2000075295).

In regard to claim 1, 14, 16-17 and 19-20, AAPA shows in Figs. 1A-C a liquid crystal display device comprising:

- a first substrate (upper substrate 8);
- a second substrate (lower substrate 4) arranged facing each other with a pre-set gap in-between;
- liquid crystals 16 held in said gap;
- means for driving a cell with applying an electrical field to said liquid crystals to change the state of orientation thereof;

- a wall structure 17 formed in each of a plurality of small-sized areas obtained on sub-division along at least one substrate for orienting the liquid crystals lying in each small-sized area axially symmetrically on application of said electrical field; wherein (a) wall structure encircling a rectangular area is formed on the first substrate 8; said rectangular area forming a concave structure 15 (paragraphs 9-12); (b) the liquid crystals in each small-sized area are divided into four group, each group is bound by a respective portion of the wall structure; (c) the liquid crystals in the given group are oriented in a direction perpendicular to the respective portion of the wall structure for that group;

wherein

Claim 12:

- said means (electrodes 10 and 10Z) for applying the electric field comprising an electrode formed on each of the substrates, wherein the electrodes are facing electrodes with said liquid crystals therebetween

However, in a conventional art, applicants fail to disclose the substrate including:

- a groove structure formed within the concave structure in each of said small-sized areas in first substrate 8 and adapted for adjusting the axial symmetrical orientation of said liquid crystals in cooperation with said wall structure,

- said groove structure extends along diagonal lines of said rectangular area, the liquid crystals are oriented symmetrical with respect to an axis perpendicular to a point of intersection of two diagonal lines (claims 1, 15, and 18).
- feature in claim 11.

Tokuo teaches (Figs. 17-18) the substrate including (a) a groove structure formed in each of said small-sized areas in first substrate 110 and adapted for adjusting the axial symmetrical orientation of said liquid crystals in cooperation with said wall structure, wherein said grove structure 115L/R extends along diagonal lines of said rectangular area; (b) said groove structure extends along diagonal lines of said rectangular area, the liquid crystals are oriented symmetrical with respect to an axis perpendicular to a point of intersection of two diagonal lines for realizing display of a broad visual field angle with reducing visual angle dependency having been high toward left and right directions by providing a part of right up and/or right down with respect to either side of a display pixel in a linear part of an alignment controlling inclination part.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display device as applicant admitted with a groove structure formed in each of said small-sized areas in first substrate and adapted for adjusting the axial symmetrical orientation of said liquid crystals in cooperation with said wall

structure, wherein said grove structure extends along diagonal lines of said rectangular area for realizing display of a broad visual field angle with reducing visual angle dependency having been high toward left and right directions by providing a part of right up and/or right down with respect to either side of a display pixel in a linear part of an alignment controlling inclination part as taught by Tokuo (col. 5 lines 60-67).

2. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over an applicant's admitted prior art (AAPA) in view of Tokuo (JP2000075295) as applied to claims 1, 6, 11-12, 14-20 above and in further view of Kojima et al. (US5650867).

AAPA and Tokuo fail to disclose features of claims 4-5.

Kojima et al. teach (Fig. 3) a liquid crystal display device, wherein said one substrate 14 is a transparent plate and a color filter layer 31, transparent insulative film 13 on color filter for protecting color filter, and a transparent electrically conductive layer (electrode 11) formed on one surface thereof.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display device as Tokuo disclosed with color filter formed on substrate for realizing color display, transparent insulating film inserting between color filter and a transparent electrically conductive layer for protecting color filter (col. 5 lines 61-62, col. 6 line 21-22) taught by. Kojima et al.

3. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over an applicant's admitted prior art (AAPA) in view of Tokuo (JP2000075295) as applied to claims 1, 6, 11-12, 14-20 above and in further view of Kume et al. (US6330049B1).

AAPA and Tokuo fail to disclose features of claim 6.

Kume et al teach (in abstract) liquid crystals are of negative dielectric constant anisotropy and the surfaces of said two substrates are processed for orientation for orienting said liquid crystals perpendicularly in the absence of applied voltage for forming the partition wall has a section which is inclined with respect to the surface of the first substrate when applied voltage in order to widen viewing angle (in abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display device as Tokuo disclosed with liquid crystals are of negative dielectric constant anisotropy and the surfaces of said two substrates are processed for orientation for orienting said liquid crystals perpendicularly in the absence of applied voltage for forming the partition wall has a section which is inclined with respect to the surface of the first substrate when applied voltage in order to widen viewing angle as taught by Kume et al. (in abstract).

4. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over an applicant's admitted prior art (AAPA) in view of Tokuo (JP2000075295)

as applied to claims 1, 6, 11-12, 14-20 above and in further view of Yamada et al. (US6437845B1).

AAPA and Tokuo fail to disclose features of claims 7-9.

In regard to claim 7, Yamada et al. teach the photopolymerizable resin (i.e., the monomer) added to the liquid crystal (col. 1 lines 50-53), which results in a liquid crystal display device having excellent display qualities due to the reduction of poorly oriented liquid crystal, thereby stabilizing the state of axially symmetrical orientation produced on application of an electrical field.

In regard to claim 8, Yamada et al. teach (Fig. 2A-C) the axially symmetrical orientation of said liquid crystals is distorted along a central axis and display is performed by exploiting TN mode liquid crystals, which utilizes optical rotating characteristics for realizing large screen display (col.1 lines 7-11).

In regard to claim 9, Yamada et al. teach a chiral substance is added to the liquid crystals for distorting the state of orientation thereof (col. 14 lines 32-64).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display device as applicant admitted with (a) the limitation of claim 7 for excellent display qualities due to the reduction of poorly oriented liquid crystal as taught by Yamada et al.; (b) the limitation of claim 8 for realizing large screen display; and limitation of claim 9 for improving the stability of the axially symmetrical alignment as taught by Yamada et al. (col. 14 lines 32-64).

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over an applicant's admitted prior art (AAPA) in view of Tokuo (JP2000075295) as applied to claims 1, 6, 11-12, 14-20 above and in further view of YAMAMOTO (EP 0 886170A2).

AAPA and Tokuo fail to disclose features of claim 10.

YAMAMOTO teach (in abstract) a liquid crystal display device wherein the axially symmetrical orientation of said liquid crystals is not distorted along a central axis and display is performed by exploiting ECB mode liquid crystals, which utilizes birefringence for high reliability without light leakage and unnecessary coloring even under a high temperature environment (in abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display device as Tokuo disclosed wherein the axially symmetrical orientation of said liquid crystals is not distorted along a central axis and display is performed by exploiting ECB mode liquid crystals, which utilizes birefringence for high reliability without light leakage and unnecessary coloring even under a high temperature environment as taught by YAMAMOTO (in abstract).

1. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over an applicant's admitted prior art (AAPA) in view of Tokuo (JP2000075295) as applied to claims 1, 6, 11-12, 14-20 above and in further view of Yano (US5499122A)

AAPA and Tokuo fail to disclose features of claim 11.

Yano teaches (Figs 1 and 7) the means for applying the electrical field is made up of signal electrodes (data electrodes 4 and discharged electrodes 8/9) formed in columns on one substrate 1 and discharge channels 7 formed in rows in the other substrate 3, said discharge channel being separated from said liquid crystals by a dielectric sheet 2 for generating a plasma addressed liquid crystal display device (col. 1 line 11-12).

Response to Arguments

Applicant's arguments filed on Dec 20, 2004 have been fully considered but they are not persuasive.

Applicant's ONLY arguments are follows:

There is none of the conventional art, Yamada, Tokuo, Kojima, Kume, or Yamamoto references teaches (a) a liquid crystal display having a groove structure that extends along diagonal lines of a rectangular area encircular by a wall structure; (b) the liquid crystal molecules being oriented symmetrically with respect to an axis perpendicular to a point of intersection of two diagonals lines of a rectangular area encircled by a wall structure.

Examiner's responses to Applicants' ONLY arguments are follows:

(a) The conventional art (Fig. 1) disclosed by applicants fails to disclose the groove structure as claims 1, 14-20 cited. A secondary reference of Tokuo will fulfill the groove structure that extends along diagonal lines of a rectangular

area encircular by a wall structure as cited in claims 1 and 14-20. Therefore, the combination of the conventional art (Fig.1) and Tokuo is proper.

(b) Tokuo teaches the liquid crystal molecules being oriented symmetrically and outwardly with respect to an axis perpendicular to a point of intersection of two diagonals lines of a rectangular area encircled by a wall structure. Tokuo discloses the liquid crystal molecules being oriented outwardly. However, the applicant's invention discloses the liquid crystal molecules being oriented inwardly.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAN C. NGUYEN whose telephone number is (571) 272-2296. The examiner can normally be reached on MONDAY-THURSDAY:8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim H Robert can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HOAN C. NGUYEN
Examiner
Art Unit 2871

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TARIFUR R. CHOWDHURY
PRIMARY EXAMINER